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ABSTRACT

Project COULD (Career Orientation Utilizing Language Development) was developed as a means of building skills, knowledges, and attitudes on elementary children's previously acquired backgrounds. Children learn to speak the grammar and vocabulary characteristic of the language heard most frequently at home and in the immediate environment. A series of units of instruction were developed from the concepts and vocabulary of the industries indigenous to Coos County (Oregon). Each unit of the instructional guide is designed to promote vocational awareness, exploration, and language development. The unit on harvesting fish was prepared for approximately four weeks of instruction at the third grade level. It is divided into eight sections: (1) a summary; (2) an outline of all elementary units on fishing; (3) project goals; (4) unit performance objectives; (5) vocabulary; (6) suggested learning activities (games, puzzles, and evaluation and followup activities); (7) lists of resource persons and materials (audiovisual and print media) and outlines for use by the resource person (suggestions, discussion topics, and related vocabulary); and (8) background information (suggested teacher reading, job and process flow charts for salmon and tuna trolling, and job descriptions for captain, deck hand, and fishing supply store sales clerk and stockboy). (Author/BP)

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PROJECT COULD

AN ESEA, TITLE III PROJECT SERVING COOS COUNTY, OREGON

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DONALD E. DAY • PROJECT COORDINATOR

F #1

HARVESTING FISH

GRADE 3

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COOS COUNTY INTERMEDIATE EDUCATION DISTRICT
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1974

F#1

A Model trawling boat may be ordered from the I.E.D. to supplement the commercial fishing unit. The fishing boat may be kept for a week at a time.

PROJECT COULD
CAREER ORIENTATION UTILIZING LANGUAGE DEVELOPMENT
A PACE PROJECT

Elementary and Secondary Education Act of 1965

Project COULD was developed as a means of building skills, knowledges, and attitudes upon elementary children's previously acquired backgrounds. Children learn to speak the grammar and vocabulary characteristic of the language heard most frequently at home and in the immediate environment.

A series of units of instruction were developed from the concepts and vocabulary of the industries indigenous to Coos County. The intention was to promote vocational awareness, exploration, and language development for the students in grades 3 to 8.

The information in this unit was prepared for use at the third grade level for an approximate period of four weeks.

Materials prepared by Project COULD are available from the IMC of Coos County Intermediate Education District, 2405 Colorado Street, North Bend, Oregon 97459.

SCHEDULE OF UNITS

<u>Grade Level</u>	<u>Fishing</u>
Grade 3 Unit F #1	Harvesting Fish
Grade 4 Unit F #2	Harvesting Shellfish
Grade 5 Unit F #3	Seafood Processing
Grade 6 Unit F #4	Marketing Fish
Grade 7 Unit F #5	Fishing Ecology
Grade 8 Unit F #6	Coos County Careers in Fishing

SUMMARY

This instructional guide is divided into eight sections. Each section is tabulated for easier use and quick reference.

Summary:

The intentions and reasoning for this program have been stated. For effective results, it is suggested that the teacher becomes totally familiar with the curriculum guide before beginning.

Outline:

This section gives an overall view of all of the sequenced units. Details of the information to be covered in this unit are specifically outlined.

Goals:

Objectives:

Activities:

These three sections are sequentially integrated to clearly define what activities are suggested for a particular objective and a particular goal. Each goal is numbered to correlate directly with objectives, activities and resources.

Vocabulary:

All terminology found in the unit, including particular occupations, is included in this section. Each term is defined. These definitions are intended for teacher use only.

Resources:

Locally produced material, Coos County resource people, books, pamphlets and commercially prepared media are listed with reference made to activity correlation.

Background:

This section contains additional material for teacher use.

FISHING

UNIT F #1 OVERVIEW

The following outline represents the scope of the entire set of units (grades 3-8) for the category of FISHING. Only the outline for this unit is in its completed form.

SUGGESTED TIME: FOUR WEEKS

- Jobs in Commercial Trolling and Trawling: 2 days
- Trolling and Trawling Terminology: 7 days
- Commercial Trolling and Trawling Processes: 8 days
- Environmental Factors: 3 days
- Economic Influences: 1 day

(UNIT F #1) HARVESTING FISH

- A. Jobs in harvesting fish
 - 1. Captain
 - 2. Deck Hand
 - 3. Sales Clerk
 - 4. Stock Boy
- B. Trolling and trawling terminology
(see VOCABULARY)
- C. Commercial trolling and trawling processes
 - 1. Drag Fishing
 - 2. Trolling for Salmon
 - 3. Trolling for Tuna
- D. Environmental Factors
 - 1. Influences by the industry
 - 2. Influences on the industry
- E. Economic influences of the fishing industry in Coos County

(UNIT F #2) HARVESTING SHELLFISH

- A. Jobs in harvesting shellfish
- B. Harvesting Terminology
- C. Harvesting Process
- D. Environmental Factors
- E. Economic Influences

(UNIT F #3) SEAFOOD PROCESSING

- A. Jobs in Seafood Processing
- B. Processing Terminology
- C. Processing Shellfish
 - 1. Crab
 - 2. Oyster
 - 3. Shrimp
- D. Environmental Factors
- E. Economic Influences

(UNIT F #4) MARKETING

- A. Jobs in Marketing
- B. Marketing Terminology

OUTLINE

(4)

- C. Marketing Process
 - 1. Fisheries
 - 2. Fish Markets
 - 3. Oyster Farms
- D. Environmental Factors
- E. Economic Influences

(UNIT F #5)

ECOLOGY

- A. Jobs in Ecology
- B. Ecology Terminology
- C. Processes Used by Workers in Marine Ecology
- D. Economic Influences

(UNIT F #6)

COOS COUNTY CAREERS

- A. Total Unit Review
- B. Occupational Interest Inventory
- C. Career Day

GOALS

1. To make the students aware that harvesting fish in Coos County provides various opportunities for employment on a seasonal and full time basis.
2. To make the students aware that commercial fishermen use a unique set of terms which facilitate communication among the people working in the fishing industry.
3. To make the students aware of the fact that dragging and trolling are two types of commercial fishing done in Coos County.
4. To make the students aware of the environmental factors which influence and are influenced by the commercial fishing industry in Coos County.
5. To make the students aware that the \$3 million a year commercial fishing industry plays an integral part in the total economy of Coos County.

The intention of Project COULD units is to utilize the language arts areas of reading, writing, listening, and speaking, as the vehicles to promote vocational awareness and exploration. It is not to dictate language arts curriculum, but to suggest that the vocational areas under consideration do have unique languages and concepts.

It is assumed that the language development aspect of the activities will be commensurate with the on-going language arts programs of the students participating in the various units prepared by COULD.

PERFORMANCE OBJECTIVES

1. The learners will participate in the game CHALLENGE by:
 - a. Making at least two statements during the game about what a certain worker does on his job.
 - b. Volunteering at least two correct job names during the game in response to another student's statements about some part of a job the worker does.
 - c. Telling whether the job is full or part time-work.
2. Given a choice between dragging, tuna trolling or salmon trolling, the learner will select the fishing method he wishes to work on and do the following:
 - a. Help make a mural depicting the boat and crew fishing and the equipment they use.
 - b. Define at least two of the vocabulary words and indicate their location on the mural.
3. Given their choice of dragging, salmon or tuna trolling, the learners will:
 - a. Select the area in which they wish to participate
 - b. Research the fishing process
 - c. Explain in a panel discussion the fishing process using any available media
 - d. Compare and contrast the different fishing processes.
4. The learner will list at least three of the following ways in which the environment influences or is influenced by the fishing industry in Coos County:

INFLUENCES ON THE INDUSTRY

 - a. Weather
 - b. Quantity of fish caught in ocean
 - c. Industrial pollution

INFLUENCES BY THE INDUSTRY

 - a. Number of fish caught per season
 - b. Size of fish caught and kept
 - c. Impact of foreign fishing fleets who many times fish out an area or pollute the water.
5. The learners will participate in a class discussion about why people work, how people spend their money, and how this money helps provide work and pay wages for other people. Each student will volunteer at least two points during the discussion.

THE DEFINITIONS PROVIDED ARE INTENDED FOR TEACHER USE. IT IS SUGGESTED THAT THE STUDENTS FORMULATE THEIR OWN DEFINITIONS THROUGH THE ACTIVITIES OF THIS UNIT.

VOCABULARY AND SPELLING

In this unit, 49 vocabulary words and 4 key occupations are discussed. These words and occupations can and should be used as a part of the spelling program in the classroom. You as the teacher, are the best judge as to how this should be done in your classroom. No matter how you approach the matter remember that it is just as important to know how to spell the word as it is to know how to use it correctly in speaking.

MASTER VOCABULARY LIST

A permanent listing of all current vocabulary words should be available to the students at all times during the study of fishing. Having this list of words and their definitions readily available to the children on charts, the overhead projector, the blackboard or a vocabulary notebook will provide the children with an immediate reference should the need arise. A professional in-depth type of definition will not be nearly as valuable to the children as one that they have written, discussed and put on the master list themselves. If a definition is to be useful, it must be easily understood by the children.

VOCABULARY

ALBACORE	A type of tuna which has a great deal of white meat which is especially desirable for canning. Also a name used by fishermen to refer to tuna.
AMIDSHIPS	About half way between the bow* and the stern* of the boat.
BAIT RACK	A platform at the rear of the boat which can be lowered to just about water level. The deck hands* with the hand poles climb onto this and cast the line into the water. The rack will have some sort of rail to keep the fishermen from falling into the water.
BELLY	The center portion of the net behind the square* which is somewhat funnel shaped. Lies between the square* and cod end* of the net.
BINS	Sections of the fish hold* where the fish are stored. Many times these are just areas that can be boarded off from the other areas by sliding 2 X 12's into slots. As many boards can be added as necessary to build up the bin to the desired depth.
BLOCKS	A pulley through which rope or cable is strung. Used to lift and guide the cable or rope in the desired location.
BOOM	A large pole which is mounted on a swivel* so that it can be raised and lowered and swung in board and out-board of the boat. Used to lift nets from the water onto the deck of the boat. Powered winches* run the ropes leading to the boom. Ropes then go through blocks* and hang down.
BOTTOM FISH	Any of the various species of flat fish (and other fish) that live on the bottom of the ocean.
BOW	The front or pointed part of the boat.
BRINE	A solution of sea water and salt which has a freezing point below 32° F which can be sprayed over or pumped around the fish to refrigerate them at sea.
CHART	Various maps of the coastline and/or the ocean floor.
CHUMMING	Throwing bait overboard into the water to attract tuna* to the boat.

*Defined within the Vocabulary Section.

COCKPIT	A sunken area running from one side of the boat to the other at the stern.* The salmon and tuna fishermen can stand in this area which provides sides high enough so that they will not fall overboard.
COD END	The more pointed end of the funnel shaped net where the fish are trapped. A lace type arrangement keeps the end of the net closed during trawling*. When the net is brought up on deck, the lacing is undone and the fish fall out onto the deck.
DAVET	A piece of pipe shaped like an inverted "L" from which are hung blocks*. In this way the lines are held away from the side of the boat. The davets can be swung outboard when fishing, or inboard when the gear is not in use.
DOG LINE	The line in salmon fishing that trails out behind the boat.
FATHOMETER	An instrument which tells electronically the depth of the water surrounding the boat.
FATHOM	Nautical measure equivalent to 6 feet.
FISH HOLD	The area below deck where the fish are stowed.
FISH KNIFE	A long bladed knife used to slit the fish open so that gills and guts can be removed. Has a spoon shaped protrusion on one end that is used to scrape unwanted blood from the inside of the fish.
FLOAT	A styrofoam and wood type arrangement which can be attached to the fishing lines to carry them out away from the boat.
GEAR	Any equipment used on the boat is referred to as gear.
GURDY	Any of two types of hydraulically powered winches*. The salmon gurdy has three drums around which are wrapped the fishing lines. When activated, the gurdy reels in or lets out the fishing lines. The tuna gurdy has only one pulling mechanism on it. The reel is shaped like two dinner plates placed bottom to bottom. The line is laid in this turning groove which pulls the line in, almost like a powered fishing reel.

*Defined within the vocabulary section.

HATCH	The opening in the deck leading to the hold*. Also refers to the cover over the hold*.
HOLD	An open area below deck used to store fish, and crabs. Some boats have refrigerated holds.
INTERMEDIATE ROPE	The rope threaded around the circumference of the otter trawl net* just behind the square*. When the wings* have been wound onto the reel, a rope from the boom* is attached to the intermediate rope and the net lifted up so that only the cod end* remains in the water.
IRON MIKE	A nickname for the automatic pilot installed on some boats. When set, this mechanism will keep the boat going on the prescribed course until changed regardless of wind and current.
JIG	A hook covered by feathers of various colors. The jig usually has a chrome covered head to which the leader is attached and ruby colored eyes. Used in fishing to attract the salmon and tuna as it is trolled* through the water.
LEAD LINES	A line from the boat which has attached to it a lead weight. Used for the purpose of carrying the main lines with the attached leaders deeper into the water. The lead line is used in salmon fishing.
LEADER	A lighter monofilament (single filament) line attached to the main fishing line at one end and the hook, jig*, flasher, etc., at the other end.
LORAN	A type of radio which helps the Captain locate his position while at sea. This radio gives a reading which can then be located on special Loran Charts helping the Captain to know the exact location of his vessel in any type of weather.
NET REEL	The large drums around which the net is reeled aboard the trawler. They are hydraulically powered.
OTTER TRAWL DOORS	A metal frame with planks inside to form a solid plaque or solid metal door. Their size is determined by the net size, the amount of power the boat has to pull the net and the depth at which the fishing is to be done. The doors are attached to the net by a bridle composed of the ends of the head and foot ropes. Four chains are attached to the boat by cables.

*Defined within the vocabulary section.

- OTTER TRAWL OR DRAG NET** The size of the net used depends upon the size of the boat and how much power the boat has to pull the net. The net is made to the size and specification by the captain and the deck hands. The net is composed of four sections: the wings*, which stick out and are attached to the doors* by a bridle; the square* which is the section of net directly behind the mouth; the belly* which is the cone shaped end of the net, fastened together at the end and can be opened to let the fish drop out. As the doors are pulled through the water, they pull the wings* of the net outwards. The rope which runs from one door across the top of the net is called the head rope. This rope has cork floats on it to lift the net up. The rope which runs from one door across the bottom of the net has wheel shaped lead weights attached to pull the bottom of the net open and the net from hanging up the bottom of the ocean. With the doors pulling the net outward, the head rope corks list the top of the net and the leads on the foot pull the bottom of the net down - this makes a mouth type opening at the front of the net. By increasing the speed of the trawl, the net can be raised to a more shallow depth. By slowing down, the net will drop to a greater depth. The drag net is used by shrimp and bottom fish boats.
- RADAR** Radio detecting and ranging. An electronic device which sends and receives electronic impulses. It can locate an object telling its distance from the radar and its compass bearing.
- RADIO DIRECTION FINDER** An electronic piece of equipment used to find the direction from which a radio message is being sent out. The circular antenna is turned until the S meter registers the highest strength. Then the operator looks at the compass below the antenna and takes a reading. This reading will show the direction from which the radio signal is coming. Used to locate other boats at sea and can be used to triangulate a position from two known commercial radio stations on shore.
- SET** Letting the net out to catch the fish.
- SPLITTING STRAP** A rope threaded through the circumference of the lower belly* of the net. When the splitting strap is attached to the winch cable and winched up it closes off the cod end* of the net from the belly* similar to a string placed around the center of a sock full of marbles.
- SQUARE** The portion of the otter trawl* or drag net* directly behind the mouth.
- STERN** The back end of the boat.

*Defined within the vocabulary section.

STOP	The place on the fishing lines that the swivel* is attached. Usually two fathoms apart. Used usually in salmon fishing.
SWIVEL	A small clasp type mechanism which allows the leader* to spin without becoming twisted.
TAG LINE	The line that is attached at one end to the pole or stern* of the boat and threaded through the fishing line. Used to pull the lines out away from the boat to keep the gear* from fouling or used for pulling the fishing lines.
TRAWLING	Dragging a net through the water at various speeds while net fishing.
TRAWLING CABLES	The long cables that are attached to the trawling doors* at one end and the spools of the winch* on the boat. Used for pulling the net during trawling* and reeling in the net.
TROLLING	Dragging lines through the water at various speeds while fishing for salmon and tuna.
TUNA	see ALBACORE.
WINCH	Any power driven drum aboard the boat which is used to wind and unwind cable. These may be large enough to spool from 20 to 600 fathoms (120 to 3600 feet) of cable or rope.
WINGS	The flat side portions of the net which help guide the fish into the mouth of the net. These wings are attached by a bridle to the otter trawl doors*.

*Defined within this vocabulary section.

KEY OCCUPATIONS

SALMON, TUNA AND DRAG FISHING

CAPTAIN

He is the boss aboard the vessel. He must know all there is about piloting the boat, the electronic equipment aboard, the fishing gear and the best fishing grounds, taxes on commercial fishermen, and be able to do all of the jobs aboard the boat as well as or better than his workers.

DECK HAND

This is the man who does most of the physical labor aboard the boat. He is responsible for helping the captain rig the gear at the beginning of the season, for rigging the gear for fishing that day, and taking in the gear at the end of the fishing trip. He is responsible for getting the caught fish on board the boat and icing them or making sure that they are refrigerated properly. He also does any processing of the fish that is done aboard the boat as well as the sorting.

SALES CLERK
FISHING SUPPLY
STORE

Orders stock for the store and prices it when it comes in. Helps sell the stock to the fishermen and helps them find what they are looking for. Sells fishing licenses to people and takes inventory of the stock on the shelves. Uses the cash register to ring up purchases and the adding machines to add up large purchases.

STOCK BOY
FISHING SUPPLY
STORE

Puts the stock on the shelves or in the storeroom. Makes out licenses for the fishermen and may wait on customers during a busy period. Unloads the bait which is purchased by the store for resale to the fishermen and wraps it in cellophane, stacking it in the freezer.

RESOURCE PEOPLE LISTED IN THE RESOURCE SECTION OF THIS UNIT SHOULD BE CONTACTED AT LEAST ONE WEEK IN ADVANCE OF THEIR VISIT. THEY SHOULD HAVE AVAILABLE AN OUTLINE OF THE MATERIAL YOU WISH COVERED AND A LIST OF ANY EQUIPMENT YOU WOULD LIKE THEM TO BRING. (IF ONE OF THE CHILDREN'S FATHERS COULD BE USED AS A RESOURCE PERSON, THIS MAY BE BENEFICIAL TO THAT STUDENT AND THE CLASS AS A WHOLE.)

THE TEACHER WILL NEED TO BRING THE FOLLOWING EQUIPMENT FOR USE IN THE UNIT:

2 LARGE CARDBOARD BOXES

ENOUGH DIRT TO FILL THE BOXES TO A DEPTH OF ABOUT 4-5 INCHES

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1st Week	2-A 1-A 1-B 1-C 1-D	1-E 1-F 1-C	3-A 3-B	3-B 1-C	3-F 1-G (Test for obj. 1)
2nd Week	3-C 3-D 3-F 4-A	3-E 3-B Alt.	3-E 2-E	3-E 2-E	3-I Enrichment Act.
3rd Week	3-I 3-G 3-H	3-I Alt. Enrich Act. 4-A 2-B	3-J 2-F	3-J 2-F	3-K 2-G (Test for obj. 2)
4th Week	4-B 3-B Alt.	2-D 4-C (Test for obj. 4)	3-L (Test for obj. 3) 1-C	5-A 1-C	5-B 5-C (Test for obj. 5)

The numbers on the calendar refer to activities on the following pages, which parallel objectives and goals. These are suggested activities which the instructor is free to modify and/or improvise.

ACTIVITIES

- 1-A Begin this unit by asking the children questions such as the following to help them begin thinking about fishing:
- How many of you have ever been fishing?
 - Have any of you been fishing in the ocean?
 - What type of gear did you use?
 - Were there other boats also fishing in your area? (Lead the children to bring out that there are also larger commercial fishing boats).
 - What are these larger fishing boats called? (Commercial fishing boats).
 - What does 'commercial' mean? (Allow them to look it up in a resource book if necessary).
 - Do they fish just like the sport fishermen or is there a difference? Explain.
 - What do people work on a commercial fishing boat?
 - What do these workers do?

ALTERNATE ACTIVITY: If there are any children in your class whose parents are commercial fishermen (draggers, salmon, or tuna trollers only) ask the following questions to help the class begin thinking about fishing:

- Are any of your parents commercial fishermen?
- What do they do? (Let the children tell about their parents' jobs.)
- Do other people work on the boat with your father?
- What jobs do they do?
- Have you ever gone fishing in the ocean?
- What kind of equipment did you use? Explain.

If several children have gone sport fishing, it might be fun to compare and contrast sport and commercial fishing for salmon, tuna and groundfish.

- 1-B Suggest to the class that they view the COULD prepared 16mm film entitled Fishing-Coos County Style. Instruct the class to take notes naming the jobs they see and some of the things these workers do.
- 1-C To get a broader perspective of commercial fishing and for comparing and contrasting Coos County types of fishing, the following 16mm films are recommended for viewing: (They are all listed in the resource section).

16mm Films:

- "Fishermen" (Barr Films) IED F1560 A film on old and new methods of tuna fishing using purse seines.
- "Deep Sea Trawler" (Films Inc.) IED F1386 Bottom fishing and processing on a modern Norwegian ship.
- "New England Fishermen" (EBF) IED F1235 Haddock (drag fishing) depicts fishing as a hard life and explains why fishing in New England is dying out.

"Food From the Sea" (BFA) IED F308 Tuna fishing and canning, excellent illustration of purse seining.

"Arctic Fishermen and World Trade" (BEA) IED F270 Cod fishing in Norway, example of trading fish for supplies needed by Norway.

1-D FOLLOW-UP: Discuss with the class the following points, listing job titles on the blackboard or overhead projector:

1. Job title
2. What each worker does
3. Whether the job is full or part-time

1-E GAME: CHALLENGE

Teacher preparation-----None.

Objectives-----To see which team at the end of the playing period has the greatest number of points.

Procedures-----Two teams are chosen or appointed by the teacher. Each team stands on different sides of the room facing each other. Starting at the head of each line, allow one child at a time to read from his notes, a statement about some part of a worker's job; i.e., operate the otter trawl cable winch, or sells fishing equipment to customers only when the store is busy. The person on the opposite team matches the statement with the worker who performs the job; i.e., deck hand or stock boy.

Rules-----Statements are given by first one team and then the other as one answers. The name must be matched to the job within five seconds or the student goes to the end of the line. One point is given to the team for a correct answer. For a wrong answer or no answer at all, the opposite team (the one by which the statement was made) gets the point. The student giving the wrong response or no response at all goes to the end of the line: this will help insure that the same two students don't always compete with each other. The teacher will judge whether answers are correct or wrong.

1-F ENRICHMENT ACTIVITY: THOUGHT QUESTION: Encourage the children to think aloud why being a commercial fisherman might be a good job. Ask the following question and encourage the students to discuss it with their parents to find how they feel about the subject:

Why do you think a person would become a commercial fisherman? Instruct the children to think of the things that would make this job interesting and fun. Discuss the question the following day as a class.

1-G

EVALUATION ACTIVITY (test for Goal and Objective 1)

The learners will participate in the game CHALLENGE by:

- a. Making at least two statements during the game about what a certain worker does on his job.
- b. Volunteering at least two correct job names during the game in response to another student's statements about some part of a job a worker does.
- c. Telling whether the job is full or part-time work.

ACTIVITIES

2-A Hand out a copy of the vocabulary words and key occupations as listed in the VOCABULARY section of this unit. Instruct the children to define the words as they are covered in the unit.

ALTERNATE ACTIVITY: Provide the children with materials with which to make a vocabulary notebook. As the words are brought out during the study of the unit and placed on the master vocabulary list, instruct the children to add the word and definition to their vocabulary notebooks.

2-B ENRICHMENT ACTIVITY: GAME: CHARADES

Teacher Preparation-----Place the key occupations on small pieces of paper and place them into a container.

Objectives-----For the actor on one team to pantomime the job well enough that his partner or partners can guess the occupation titles before the other team.

Procedures-----The children get together on their spare time and choose teams. One member from each team draws an occupation from the container. He plans his pantomime and acts out the job. His team members wait until they know the occupation title and say it. The team which guesses their member's occupation first wins the point. A wrong guess is a point for the other team. Occupations are then returned to the container and different team people draw.

Rules-----After one actor from each team draws his occupation, he has 30 seconds to plan the pantomime. Both actors perform for their teams at the same time. The team who guesses the occupation first gets the point. No words can be spoken by the actors. If this is done, that team automatically loses the game and the other teams are allowed only one guess at the occupation title, so they should watch the actors closely. Set a minute or less time limit for the pantomime depending upon the group.

2-C ENRICHMENT ACTIVITY: GAME ARRANGEMENT

Teacher Preparation-----The teacher should make up cards or strips of railroad board with the vocabulary word or key occupation on one and the definition on the other.

Objective-----For the player to arrange the people holding the vocabulary card so they are standing under the correct definition. The winning player gets a point for his team.

Procedures-----The students select teams or the teacher can appoint them. The teacher then tapes three or more definition cards to the board for each team A and B. Holders from Team A are given the corresponding word cards and vice versa, making sure they are mixed up. An arranger

is then selected from each team. He goes to the board and at the "go" signal, moves the Holders under the correct definitions.

The first arranger to arrange the holders under the correct definitions wins a point for his team. When he is finished, he must say "Call".

Rules-----The holders trying to stump the arranger from the other team may stand under any definition, even under the correct one. Arrangers must not begin until the "go" signal is given. When an arranger says "Call", he must not do any further arranging. If he is wrong, wait for the other arranger to finish. If both are wrong, select two new arrangers, more holders and place new definitions on the board. One point is given for a correct arrangement of all words and definitions. NOTE: Set a time limit for arranging if you feel it necessary.

2-D COLLEGE BOWL

Teacher Preparation----Make two different colored sets of all vocabulary words to be defined on 5"x8" cards, one word to a card.

Objective-----To see which team, at the end of the playing period, has the most points.

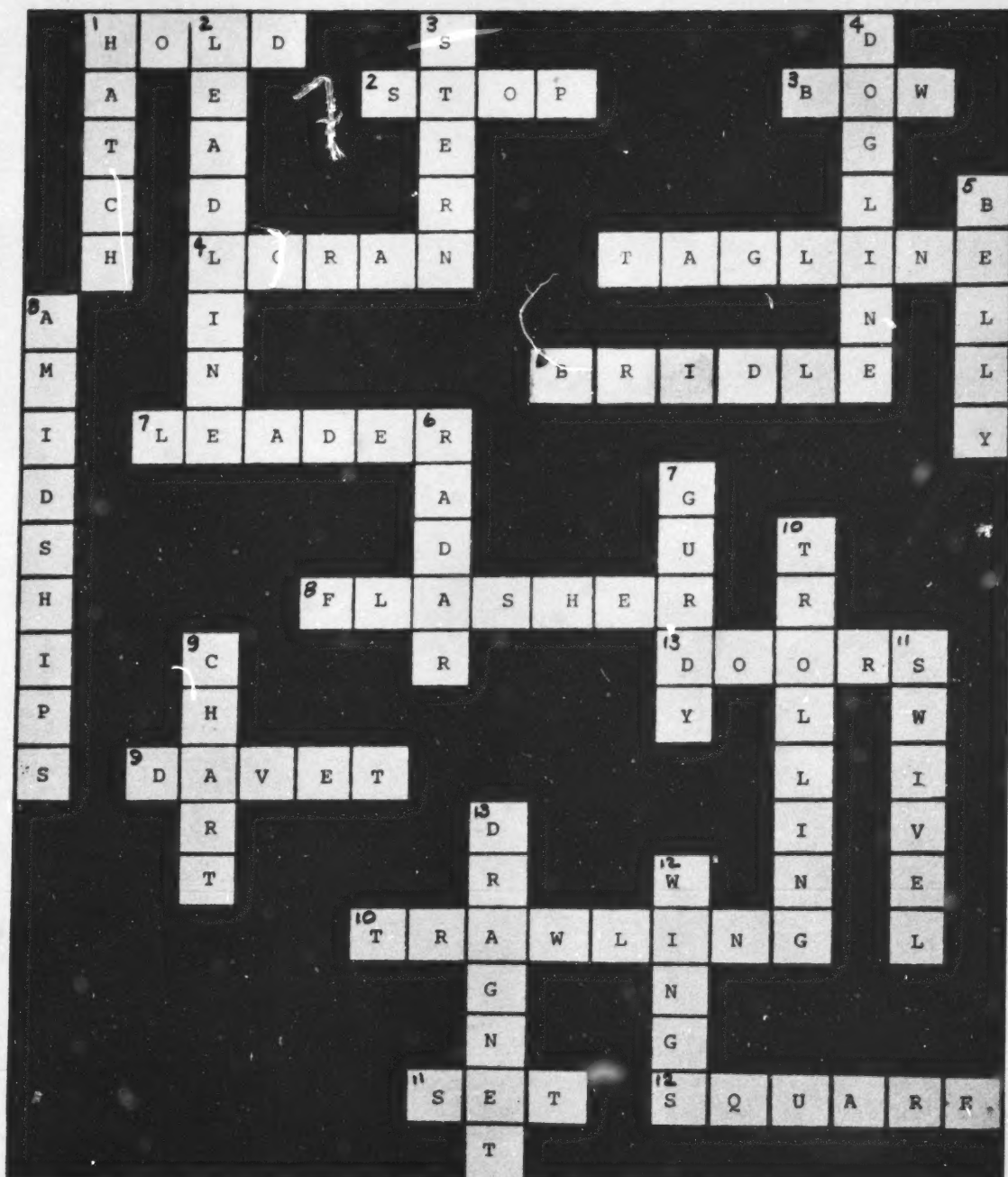
Procedures-----Divide the class into two teams. Hand out the word cards, one color for each team, one card at a time to each student until cards are gone. Give a definition orally to the class. If the student has the card with the correct term on it, he may answer the question. If he thinks he has the right card he may also try.

Rules-----To be able to answer, the student with the card must stand up and say "Call". In this way the teacher sees and/or hears the first person to stand on each team. If the answer given by the first person to stand and say "Call" is correct, his team gets the point. If he misses the question, the first person who "called" on the other team gets a chance to answer. If he is correct, his team gets the point. If both players give the incorrect answer, the definition is given later on in the game.

2-E CROSSWORD PUZZLE: Hand out either of the crossword puzzles found on the following pages to the students. Read the directions aloud and have the students follow along or instruct the children to read the directions silently. When you are sure the children understand the directions and any time limit, instruct them to begin.

2-F Allow the children to volunteer for a group to make a mural depicting the boat and crew fishing and the equipment. The three types of fishing to be covered are dragging or otter trawling, tuna trolling, and salmon trolling. Plan a space for each group to work and provide them with the

1 necessary materials to design, draw and color their mural. Instruct the group to sketch their mural on a smaller sheet of paper first, then transfer it to the larger mural. Each student should help plan, construct and execute the mural.



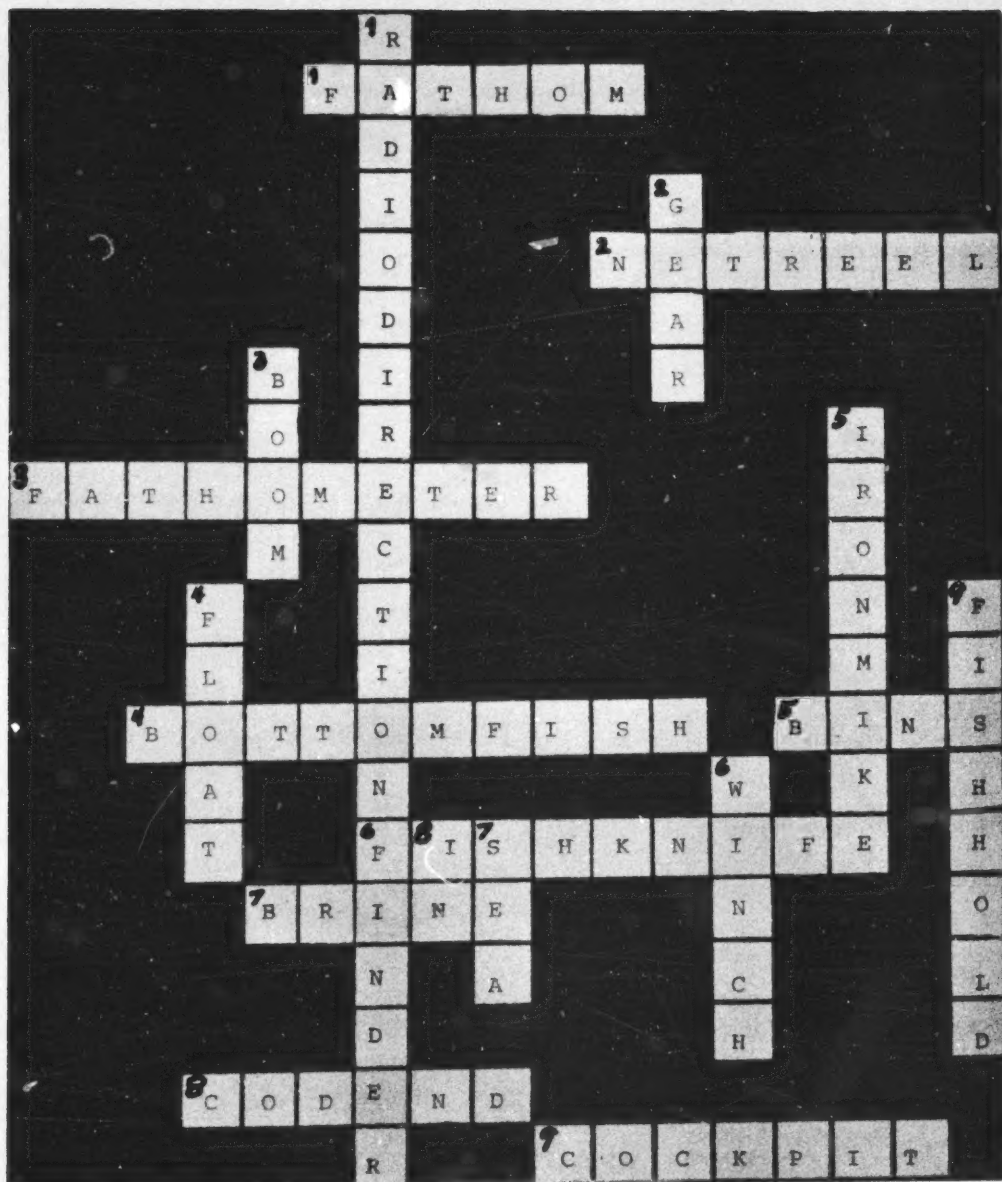
CROSSWORD PUZZLE ONE

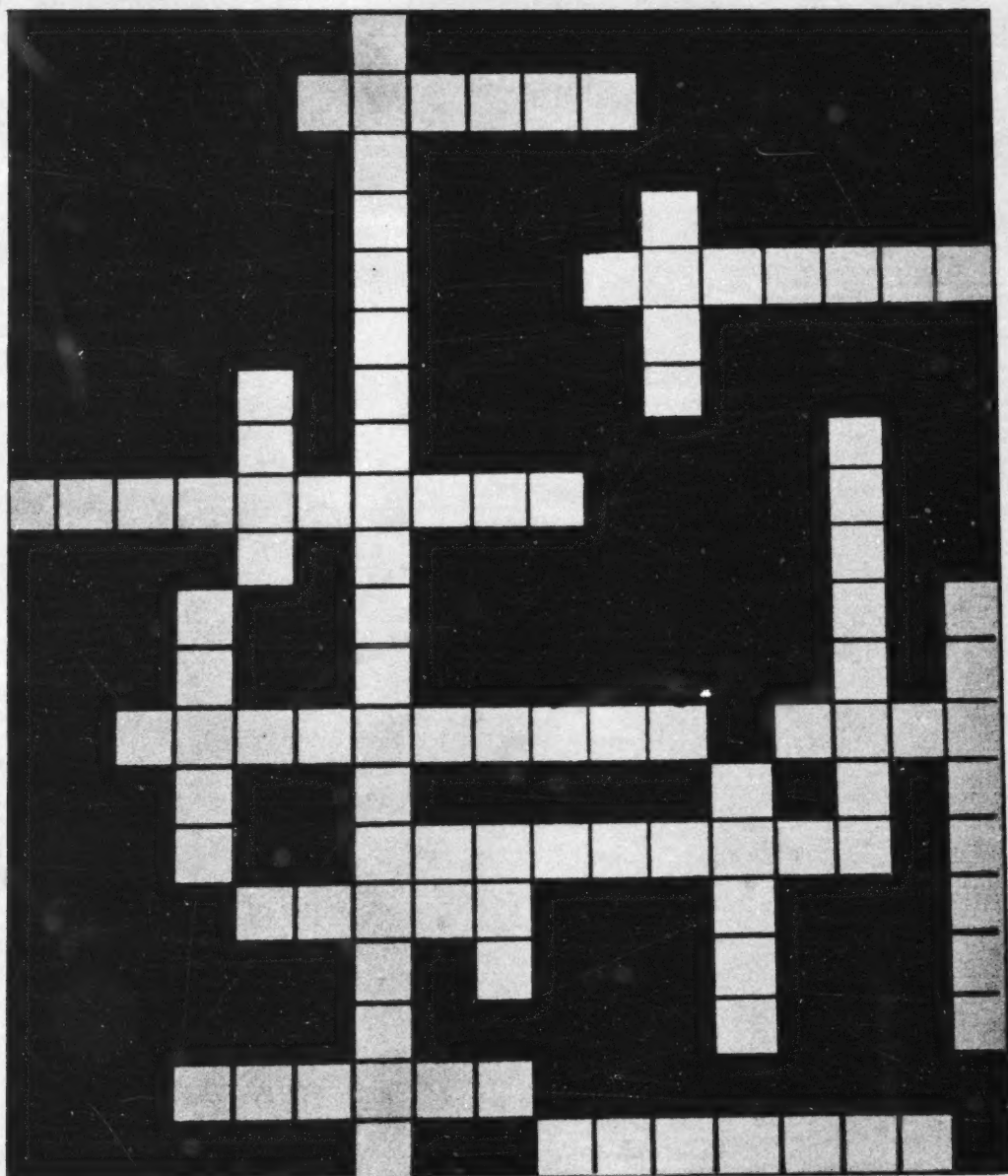
ACROSS

1. The open area below the decks in which cargo and fish can be stored.
2. A marking on the salmon fishing line every two fathoms which helps the deck hand know how much line is let out.
3. The front of the boat.
4. An electronic machine which can locate the exact location of the boat.
5. The line in tuna fishing that attaches the main fishing line to the stern or poles of the boat. Used to pull in the main lines when fish are caught.
6. Systems of ropes which attach the wings of the otter trawl or dragnet to the doors.
7. The lighter fishing line usually 2 fathoms long onto which is attached the jigs and the hooks.
8. A shiny piece of metal which when dragged through the water, attracts fish.
9. The metal "arm" shaped like an upside down L which helps hold the salmon trolling lines away from the side of the boat.
10. Using a boat to drag a net through the water to catch fish.
11. Letting the net out to catch fish in drag fishing.
12. The portion of the otter trawl or drag net directly behind the mouth.
13. Those parts of the otter trawl net which pulls the wings of the net open when dragged through the water.

DOWN

1. The opening in the deck leading to the hold.
2. The line to which a lead weight is attached.
3. The back end of a boat.
4. The line in salmon fishing which drags straight out behind the boat.
5. The center portion of the otter trawl or drag net behind the square, but in front of the cod end.
6. The name for the electronic machine which is used for radio detecting and ranging.
7. The name given to small winches used to haul in and let out salmon and tuna fishing lines.
8. A word used by seamen to talk about the middle of the boat between the bow and stern.
9. A map showing the ocean floor and any nearby land. Used to help the captain locate his ship's position.
10. Dragging fishing lines through the water with a boat.
11. A metal piece of equipment which lets lines spin as they go through the water without twisting and breaking.
12. The long sides of the otter trawl or drag net which are attached to the doors by the bridle.
13. The name of the net used in otter trawling or drag fishing.





CROSSWORD PUZZLE TWO

ACROSS

1. A measure used by seamen which is six feet long.
2. The large spool which the otter trawl or drag net is wound around.
3. An instrument that measures how deep the water is.
4. Flat fish that live on the bottom of the ocean.
5. The places in the hold where the fish are placed.
6. The special knife used to gut salmon.
7. A mixture of salt and water.
8. The pointed end of the otter trawl or drag net which can be opened to drop the fish out of the net onto the deck of the boat.
9. The sunken area at the stern of the boat where salmon fishermen stand. It has high sides so they will not fall overboard.

DOWN

1. The radio which can be used to find out where the boat is in the ocean. It has a round antenna and a compass on top.
2. A name the fishermen call most equipment they use.
3. The large pole which is used to help lift the full drag nets from the water.
4. The piece of gear which is attached to a fishing line to float it out away from the boat.
5. The machine which will pilot the boat on a steady course once the captain turns it on and sets it.
6. An hydraulic powered machine which pulls in and winds ropes and cables.
7. Another name for the ocean.
8. A word which is the opposite of out.
9. The hole below the deck of the boat where the fish are stored.

ACTIVITIES

2-G EVALUATION ACTIVITY (Test for Goal and Objective 2)

Given a choice between dragging, tuna trolling or salmon trolling, the learner will select the fishing method he wishes to work on and do the following:

- a. Help make a mural depicting the boat and crew fishing and the equipment they use.
- b. Define at least two of the vocabulary words and indicate their location on the mural.

ACTIVITIES

- 3-A Ask the children questions such as the following to help them begin thinking about different fishing methods:
 What different types of equipment can a person use to catch fish?
 (net, pole and line, spear, bow and arrow, trap)
 Which methods do you think would work best in the ocean? Why?
 Which method would probably help you catch the most fish at one time?
 Why? Use the COULD prepared study prints "Trawling Gear" and "Salmon and Tuna Trolling Gear".

- 3-B Suggest that since both net and line fishing are used on commercial fishing boats that the class try to find out more about how the methods are used. Ask the class how they could go about learning more about these two methods. List their ideas on the chalkboard or overhead projector (movies, slides, books, visits to boats, having fishermen visit the class).

NOTE: If you wish to allow the class some hand in planning this portion of the unit study, encourage the students to make suggestions as to what steps to follow, then select the appropriate activities from the following in a sequence which fits your class plans.
 PLEASE READ ALL OF ACTIVITY 3-F BEFORE PROCEEDING WITH THE NEXT ACTIVITY.

ALTERNATE ACTIVITY: Select from the 16mm films listed in Activity 1-C appropriate films for showing the various fishing methods. Also compare these methods with the COULD produced 16mm film "Fishing - Coos County Style". Allow proper time after viewing for the children to discuss the films.
 List the vocabulary words on the chalkboard or overhead projector or hand the children a ditto page.

cod end	bottom fish	belly
winch	otter trawl doors	square
boom	wings	intermediate rope
splitting strap	deck hand	net reel
hatch	captain	set
fish hold	fathometer	brine
radar	trolling	trawling
radio direction finder		

Let the children volunteer to define three of the words and instruct them to take notes on the fishing process itself. Use the COULD prepared study prints: "Trawling Gear" and "Salmon and Tuna Trolling Gear".

- 3-D FOLLOW-UP: Allow those children with the same words to help write out a definition to those words on the chalkboard or overhead projector. Discuss as a class the step by step process used in otter trawling or dragging, listing the steps on the board as they are brought up. Use the COULD prepared 16mm film "Fishing - Coos County Style".

- 3-E Some of the children might like doing research on the types of fish caught by net and line fishing. Let the children volunteer to work in small groups to research the following species of fish:

salmon rockfishes
 albacore tuna lingcod
 flat fishes (also called sole)

Use the COULD prepared study prints "Common Species of Fish".

Instruct the children to select their species of fish pictured in the COULD prepared study prints for preliminary research. When the group has finished the preliminary research, they may then go to other sources such as encyclopedias, library books, etc. Have the groups make written reports and mount them on a bulletin board along with the study prints and any pictures they have drawn of the fish or use these media for an oral report before the class.

NOTE: Be contacting any of the fisheries in Coos County or the boat captains. You might be able to receive real samples of some of the smaller fish covered by the research. It would be worth the effort to check into this idea. Also a call to the Oregon Fish Commission in Charleston might prove interesting.

- 3-F ENRICHMENT ACTIVITY: In a class discussion, use questions such as the following in preparation for inviting a resource person to class: If we were to invite a commercial drag fisherman to class, what things do you think he would like to know about us (school, class, number of students, time of visit, what we are studying)? List on chalkboard or the overhead projector.

Would it help for us to tell him something about what we would like to know? How would it help?

What things would you like to know about the fisherman and his boat? List on chalkboard or overhead projector. (Save this list for activity 3-H.)

When the list is completed, allow time for the children to copy down questions they wish to ask the captain.

NOTE: You may wish to invite the speaker in to view the media with the class and allow him to discuss with the class any questions they may have as well as answering the questions decided upon in this activity.

ALTERNATE ENRICHMENT ACTIVITY: Use questions such as those in Activity 3-E to discuss with the class a possible field trip to visit a dragger. When you arrive at the boat, allow the children to ask the questions they decided upon during the discussion. Encourage the students to bring cameras along and take pictures of their field trip. If the school has a camera, the teacher may wish to take slides for use in future years by other faculty members. Also a tape recorder operated by a student can be an excellent help during a follow up session.

FOLLOW-UP: Listen to the tape recording and define as a class any vocabulary words, then list the step by step fishing process.

- 3-G Ask questions such as the following to help the children begin thinking about how salmon and tuna trollers are rigged: Why do you suppose some boats use lines instead of nets? Can you think of a way more than one fish could be caught at a time on a boat where they use lines? Explain.

Suggest to the class that they view one or more of the COULD produced media listed below:

16mm film: "Fishing - Coos County Style"

Study Prints: "Trawling Gear" and "Salmon and Tuna Trolling Gear"

List the vocabulary words on the chalkboard or overhead projector or hand out a ditto page:

loran	amidships
radio direction finder	stern
chart	cockpit
float	salmon gurdy
stop	tuna gurdy
fathom	dog line
leader	jig
fish knife	davet
tagline	trolling
chumming	

Let the children volunteer to define three of the words and instruct them to take notes on the fishing process itself.

- 3-H FOLLOW-UP: Allow the children with the same words to help write out a definition for those words on the chalkboard or overhead projector. Discuss with the class the step by step process used in trolling for salmon and trolling for tuna, listing the steps on the chalkboard or overhead projector as they are brought up.
- 3-I ENRICHMENT ACTIVITY: Review the lists made in Activity 3-F, applying them to commercial trollers and follow the procedures listed after the questions in that activity.
 ALTERNATE ENRICHMENT ACTIVITY: Use questions such as those in Activity 3-E to discuss a possible field trip to visit a troller. When you arrive at the boat, allow the children to ask the questions they decided upon during the discussion. Encourage the students to bring cameras along and take pictures of their field trip. If the school has a camera, the teacher may wish to take slides for use in future years by other faculty members. Also a tape recorder operated by a student can be an excellent help during a follow-up session.
 FOLLOW-UP: Listen to the tape recording and define as a class any vocabulary words, then list the step by step fishing process.
- 3-J Suggest to the children that they work in three groups and have a panel discussion in which they would explain the fishing process used in dragging, trolling for salmon and trolling for tuna. Then compare and contrast the three. Let them select the fishing method on which they wish to report, and get together in three groups. Instruct the students to plan how they will explain the fishing process and what media they will use. (Encourage use of the mural from Activity 2-G for vocabulary.) They should present a step by step process as well as telling who does the work and what equipment is used. Also remind them that in a panel discussion each member tells

something about the area being discussed, so they should plan what material is to be covered by each student. Be sure the students understand the instructions and any time limits set for this planning before they begin.

- 3-K Allow each group to make their presentation gathering any media they will use ahead of time. After their presentations, in a class discussion bring out the likenesses and differences in the fishing methods using questions such as the following: (list in 2 columns on the chalkboard or overhead projector).

In what ways are trolling for salmon and tuna alike?

How are they like dragging?

How are trolling for salmon and trolling for tuna different?

How do these methods differ from dragging?

ENRICHMENT ACTIVITY: The children may enjoy any of the following ideas for use with Activity 3-J:

1. Use a tape recorder to record panel discussions.
2. Use a video tape to record the panel discussions and the comparison and contrast session. Play at a PTA meeting or for other classes.
3. Invite another class in to listen to the panel discussion.
4. Invite parents to attend the panel discussions or present it again for PTA or Open House.

- 3-L EVALUATION ACTIVITY (Test for Goal and Objective 3)

Given their choice of dragging, salmon or tuna trolling, the learners will:

- a. Select the area in which they wish to participate
- b. Research the fishing process
- c. Explain in a panel discussion the fishing process using any available media.
- d. Compare and contrast the different fishing processes.

- 4-A In a class discussion after each resource speaker's visit, list the problems fishermen have on a chart and keep it for reference during Activity 4-B. Invite resource speakers from the Oregon Fish Commission in Charleston.
- 4-B Review the problems fishermen have in their jobs by asking questions such as the following:
What problems can a fisherman have in his job? (List on the chalkboard or the overhead projector or add to the list from Activity 4-A).
Can the fisherman do anything about any of these problems?
Which ones? What can he do to solve the problem?
What does the word "environment" mean? (Allow the children to look up the meaning in a reference book if necessary and write the definition on the chalkboard or the overhead projector).
Which of these problems is caused by the environment?
Which problems can the fisherman cause?
Are there any other problems that affect the fisherman that we have not listed?
- 4-C EVALUATION ACTIVITY (Test for Goal and Objective 4)
The learner will list at least three of the following ways in which the environment influences or is influenced by the fishing industry in Coos County:
INFLUENCES ON THE INDUSTRY
A. Weather
b. Quantity of fish caught in ocean
c. Industrial pollution
INFLUENCES BY THE INDUSTRY
a. Number of fish caught per season
b. Size of fish caught and kept
c. Impact of foreign fishing fleets who many times fish out an area or pollute the water.

- 5-A Ask questions such as the following to help the children begin thinking about how commercial fishing effects the economy of Coos County:
Why do people, such as these fishermen we have been studying, work? (List their ideas on the chalkboard or the overhead projector).
For what do they spend their money? (List).
When fishermen spend their earnings, how does this help other people in the county and country?
- 5-B Suggest that the class read the COULD prepared pamphlet entitled "How the Fisherman Spends His Money" to find out more about how the money earned by the fishermen helps others in the county. Allow the children to read the story aloud or assign it as silent reading. As a class list the ways in which this family spends its money. Then discuss how each way helps other people in the county.
ALTERNATE PROCEDURE: Suggest that the class read the COULD prepared pamphlet entitled "How the Fisherman Spends His Money" to find out more about how the money earned by the fisherman helps others in the county. Accept volunteers or assign small groups of a workable size and let the children share the oral reading of the story. Instruct them to list all the ways the family spent money and then discuss how this money helps other people in the county. Make sure the groups understand the instructions and any time limit to be observed before you allow them to begin. Allow each group to read their list or place it on the chalkboard or the overhead projector and tell how this money helps others. The teacher should direct the students to arrive at Goal 5 through questions appropriate to his or her class' instructions.
- 5-C EVALUATION ACTIVITY (Test for Goal and Objective 5): The learners will participate in a class discussion about why people work, how people spend their money, and how this money helps provide work and pay wages for other people. Each student will volunteer at least two points during the discussion.

COULD PREPARED MATERIALS

	Activity No.
16mm FILM	
FISHING - COOS COUNTY STYLE	1-B 3-B 1-C 3-D 3-G
PRINTED MATERIALS: PAMPHLETS	
HOW THE FISHERMAN SPENDS HIS MONEY	5-B
STUDY PRINT SETS	
TRAWLING GEAR	3-A
SALMON AND TUNA TROLLING GEAR	3-C
COMMON SPECIES OF FISH	3-G 3-E 3-K 3-K Enrich.

COMMERCIALY PREPARED MATERIALS

BOOKS

<u>Scales and Fins</u> , F. E. Engleman, 1938, D.C. Heath and Co., Boston	3-E
North Bend Library Number 590 E3c	
<u>The Wonder World of Fishes</u> , Ida Mellen, 1951, Dodd, Mead and Co.	3-E
North Bend Library Number 597 M48	
<u>The Study of Fishes Made Easy</u> , Eugene V. Mohr, 1962, Doubleday and Co., New York	3-E
North Bend Library Number 537 M726	
<u>Fishing For Tuna</u> , Lewis Allison, 1957, Melmont Publishers Los Angeles, Calif.	3-G
Coos Bay Library Number YP 639.2	
<u>Salmon</u> , Wallace Dillon, 1962, Follett Publishing Co., Chicago, Ill.	3-E
Coos Bay Library Number YP 597.5D	
<u>Of Ships and Fish and Fishermen</u> , Dirk Gringhuis, 1963, Albert Whitman and Co., Chicago, Ill.	3-C, 3-K
Coos Bay Library Number YP 333.9	
<u>Nets Overboard</u> , Jack Coggins, 1965, Dodd Mead and Co., New York	3-C
Coos Bay Library Number YP 639 C	

16mm SOUND FILMS

<u>Fishermen</u> (Barr Films) IED F1560	1-C, 3-B Alt.
<u>Deep Sea Trawler</u> (Films Inc.) IED F1386	1-C, 3-B Alt.
<u>New England Fishermen</u> (EFB) IED F1235	1-C, 3-B Alt.
<u>Food From The Sea</u> (BFA) IED F308	1-C, 3-B Alt.
<u>Arctic Fishermen and World Trade</u> , (BFA) IED F270	1-C, 3-B Alt.

RESOURCE SPEAKERS

The following people have consented to act as resource people. They should be contacted at least one week in advance of their visit to give them time to prepare for their presentation and gather materials needed.*

<u>NAME</u>	<u>OCCUPATION</u>	<u>PHONE NO.</u>
Dave Hansen	Co-Owner Hansen's Landing	888-3855
Bob Green	Captain	888-4644
Fred Anderson	Captain of A Dragger	888-3646
Dick Lillianthal	Captain	888-3907
Buzz Taylor	Captain of a Troller & Dragger	888-4122
Paul Heikala	Manager: All-Coast Fishermans Association	888-5215
Jack Wilski	Manager: Nelson Log Bronc Company	269-5101

To contact other Captains in your area call:

Tom Peterson	Owner: Peterson's Seafood	888-3251
Jerry Sinclair	Fisherman's CO-OP Association	888-4114
Kerry Cox	Bandon Fisheries	347-2409
Larry Nelson	Manager: Eureka Fisheries	888-3248
Jerry Patrick	Manager: Bandon Fisheries	347-2118
Bob Mullen	Aquatic Biologist	888-3771
Bill Barss	Aquatic Biologist	888-3771
Bruce Mate	Marine Extension Agent	267-7009

*Some parents of children in your classroom may be able to serve you as resource speakers. If this is the case, they should be contacted.

RESOURCE OUTLINE: CAPTAIN OF A COMMERCIAL DRAGGER

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS _____

SCHOOL PHONE _____

TEACHER _____

TEACHER'S HOME PHONE _____

- A. If at all possible, the resource person should bring as much equipment used on the job as possible. The children will learn more about the equipment used and the job if they can see the tools; small pieces of the various lines used on the boat, charts, a cork from the head rope and a lead from the foot rope and other equipment as well as a simple demonstration of net mending will help the children better visualize your job. Samples of the fish you catch would prove interesting to the students.

NOTE: A set of large study prints is available to the teacher showing the various equipment used in trawling. If you would like to use these pictures in your talk, please notify the teacher so that she might order them before your visit.

B. Points to discuss

1. Why did you become a fisherman?
2. What are the minimum qualifications for your job? Physical and educational?
3. What do you like most about your work?
4. What do you like least about your job?
5. What are the working conditions and hours?
6. What are the earnings?
7. How does the environment affect you and your job?
8. What effects do pollution and the foreign fishing fleets have on the fishing?
9. Are there any laws which you have to follow when fishing and piloting a boat? Explain.

C. Vocabulary words to cover with the children:

- | | |
|----------------------|---------------------------------|
| 1. cod end | 11. net reel |
| 2. belly (net) | 12. captain |
| 3. square (net) | 13. fish hold |
| 4. wings (net) | 14. splitting strap |
| 5. winch | 15. trolling |
| 6. boom | 16. fish hold |
| 7. otter crawl doors | 17. set, as in 'to make a set'. |
| 8. brine | 18. fathometer |
| 9. bottom fish | 19. deck hand |
| 10. hatch | |

RESOURCE OUTLINE: CAPTAIN OF A COMMERCIAL SALMON TROLLER

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS _____

SCHOOL PHONE _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

- A. If at all possible, the resource person should bring as much equipment used on the job as possible. The children will learn more about the equipment used and the job if they can see the tools; small pieces of the various lines, used in fishing, the lead from a lead line, a fish knife, a jig, a flasher, a fish mit, charts and other equipment as well as a demonstration of how you rig your fishing line will help the children better visualize your job.

NOTE: A set of large study prints is available to the teacher showing the various equipment used in trolling for salmon and tuna. If you would like to use these pictures in your talk, please notify the teacher so that she might order them before your visit.

B. Point to discuss

1. Why did you become a fisherman?
2. What are the minimum qualifications for your job: physical and educational?
3. What do you like most about your job?
4. What do you like least about your job?
5. What are the working conditions?
6. What are the earnings?
7. How does the environment affect you and your job?
8. What effects do pollution and the foreign fleets have on the fishing?
9. Are there any laws which you have to follow when fishing and piloting a boat? Explain.

C. Vocabulary words to cover with the children:

- | | |
|---------------------------|------------------|
| 1. loran | 12. amidships |
| 2. radio direction finder | 13. stern |
| 3. chart | 14. cockpit |
| 4. float | 15. salmon gurdy |
| 5. stop | 16. tuna gurdy |
| 6. fathom | 17. dog line |
| 7. leader | 18. jig |
| 8. fish knife | 19. chumming |
| 9. davet | 20. captain |
| 10. tag line | 21. deck hand |
| 11. trolling | |

RESOURCE OUTLINE: CAPTAIN OF A COMMERCIAL TUNA TROLLER

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

- A. If at all possible the resource person should bring equipment used on the job. The children will learn more about the equipment used and the job if they can see the tools; small pieces of the various lines, used in fishing, the lead from a lead line, a fish knife, a jig, a flasher, a fish mit, charts and other equipment as well as a demonstration of how you rig your fishing line will help the children to better visualize your job.

NOTE: A set of large study prints is available to the teacher showing the various equipment used in trolling for salmon and tuna. If you would like to use these pictures in your talk, please notify the teacher so that she might order them before your visit.

B. Point to discuss:

1. Why did you become a fisherman?
2. What are the minimum qualifications for your job: physical and educational?
3. What do you like most about your job?
4. What do you like least about your job?
5. What are the working conditions?
6. What are the earnings?
7. How does the environment affect you and your job?
8. What effects do pollution and the foreign fleets have on the fishing?
9. Are there any laws which you have to follow when fishing and piloting a boat? Explain.

C. Vocabulary words to cover with the children

- | | |
|---------------------------|------------------|
| 1. loran | 12. amidships |
| 2. radio direction finder | 13. stern |
| 3. chart | 14. cockpit |
| 4. float | 15. salmon gurdy |
| 5. stop | 16. tuna gurdy |
| 6. fathom | 17. dog line |
| 7. leader | 18. jig |
| 8. fish knife | 19. chumming |
| 9. davet | 20. captain |
| 10. tag line | 21. deck hand |
| 11. trolling | |

Of the over \$17 million earned by fishermen in Oregon during 1970, over \$3 million was earned right here in our own county. The over 3 million pounds of tuna and salmon brought local fishermen about \$1 million last year. These monies play a vital role in the economy of Coos County and help make fishing the second largest industry in our area.

Three hundred and fifty full time fishermen comprise the biggest share of the fishing fleet. Of these men, one hundred ninety-six own or rent boats and the rest work as deck hands. But these figures do not show the many part time or seasonal fishermen nor do they take into account the fact that during the summer, many times commercial fishing becomes a family affair with the entire crew being comprised of family members.

For the full time fishermen, fishing is a serious business with no guaranteed return on his investment. A new boat, costing from \$25 to \$100 thousand, insurance on the boat and crew, fishing gear purchases and replacements, and a 5% to 15% cut of the dollar value of the take by each member of the crew, quickly eats away the profits during a slow fishing season. To this uncertainty, the question of fish prices must be added. If a fisherman goes out on a trip without knowing what price he will get for the fish, he could spend more money on the trip than he will receive for his catch. He must also face problems caused by industrial pollution and the impact of the foreign fishing fleets who do not observe our laws on environmental protection. So, it is not hard to see that commercial fishermen must also be shrewd gamblers as well as good small businessmen.

With all these problems to face why does a man turn to commercial fishing to earn his living? Many began as deck hands and enjoyed the work and the sea while earning enough to buy their own boats. Some started as workers in the fishery and from there became deck hands. But most learned the trade from their parents and chose to follow in their footsteps, making fishing a family tradition. Also not to be overlooked are the loggers, doctors, teachers, and laborers who choose fishing as a part time occupation with which to supplement their incomes. These varied backgrounds make fishermen an interesting and diversified group.

In the past, the commercial fishermen have been a disorganized group of individuals who worked alone. But now, to combine their bargaining power and obtain better prices for their fish, they have banded together to form the Commercial Fishermen's Association and the Commercial Fishermen's Wives Association (two powerful groups which bargain for fish prices before the season begins thereby taking some of the gamble out of the occupation). Together, these two groups form a powerful lobby group within our state as they push for legislation which will protect our marine fisheries from destruction or invasion by foreign fleets. The wives have a boycott power which has at least some power to influence those who are industrial polluters of our waters. These two groups have brought an improvement in the fishing industry which is hard to overlook.

On the following pages will be found a suggested reading list for the teacher which will help give a broader background of the industry, several flow and process charts and explanations and a detailed job description of those people involved in the industry and related industries.

SUGGESTED TEACHER READING:

A GUIDE TO FISHING BOATS AND THEIR GEAR, Carvel Hall - Blair and Willits
Dyer Ansel, 1968, Carnell Maritime Press, Inc., Cambridge

COMMERCIAL FISHING GEAR OF THE UNITED STATES, William Dumont and G. T. Sundstrom, 1961, United States Fish and Wildlife Service, Washington, D.C.

SWOCC Library Number PAM 639.2

JOB AND PROCESS FLOW CHART: TROLLING SALMON

1. Deck hand and captain change the gear on the boat for a new season by:
 - a. Placing 50, 30 and 15 pound lead weights on the deep lines.
 - b. Putting the davets in place on either side of the stern.
 - c. Attaching the three blocks to each of the davets.
 - d. Mounting a three spool gurdy on either side of the stern of the boat.
 - e. Attaching swivels to the deep lines at two fathom stops seven per deep line.
 - f. Attaches clasp to one end of two fathom leader and a flasher and hook to the other end.
2. Captain pilots the boat out to the area to be fished using the navigation aids on the boat and then uses the fathometer to find the fish.
3. Deck hand uses the gurdy to lower the lead line to the swivel on the deep line with a clasp. He will put seven of these on a deep line. After the leaders have been attached, he continues to lower the deep line several more stops, then attaches a line from the pole onto the deep line to pull it away from the side of the boat.
4. Deck hand repeats the procedure in step 3 for the lead line with the 30 pound lead on it, (sometimes called the intermediate line) except before attaching the line from the pole to pull the lead line away from the boat, he attaches a float by a clamp. The float is attached in such a way that it will carry the line away from the boat at about a 45° angle as it is let out several stops. He then uses the gurdy to lower this lead line to help pull the line away from the boat.
5. The deck hand does the same with the lead line with the 15 pound lead on it. (sometimes called the dog line). The only difference here is that the float is attached in such a way that it pulls the line straight out behind the boat about 100 feet.
6. When a fish is caught on one of the leaders every 5-10 minutes, the deep lines are winched in by the deck hand using the gurdy. He first removes the line running from the pole which is hooked to the deep line and ties it to a cleat on the boat. Next he removes the float as it comes on board. (On the deep lines with the 30 and 15 pound weights only) and finally as the first leader comes in he unclasps the leader from the swivels on the deep line, clasps it to the boat, and reels in the leader by hand, coiling the line on the deck of the cockpit.
7. If there is a fish on the hook, the deck hand uses a gaff hook to bring the salmon on board and clubs it behind the head with a weighted club to kill it.
8. The deck hand removes the hook from the salmon. He then continues to check all the leaders on that lead line as they come in. He will then repeat steps 3 through 6 with that lead line.
9. The deck hand then uses a fish knife to cut the gills out of the salmon and makes a slit from the anal pore up the belly to within 1 to 1 1/2 inches of the cut made to remove the gills. He grabs the guts with his hand and pulls them out, cutting them loose at the backbone in the neck region. He uses the spoon end of the knife to run down the backbone and remove all the blood and blood vessels.

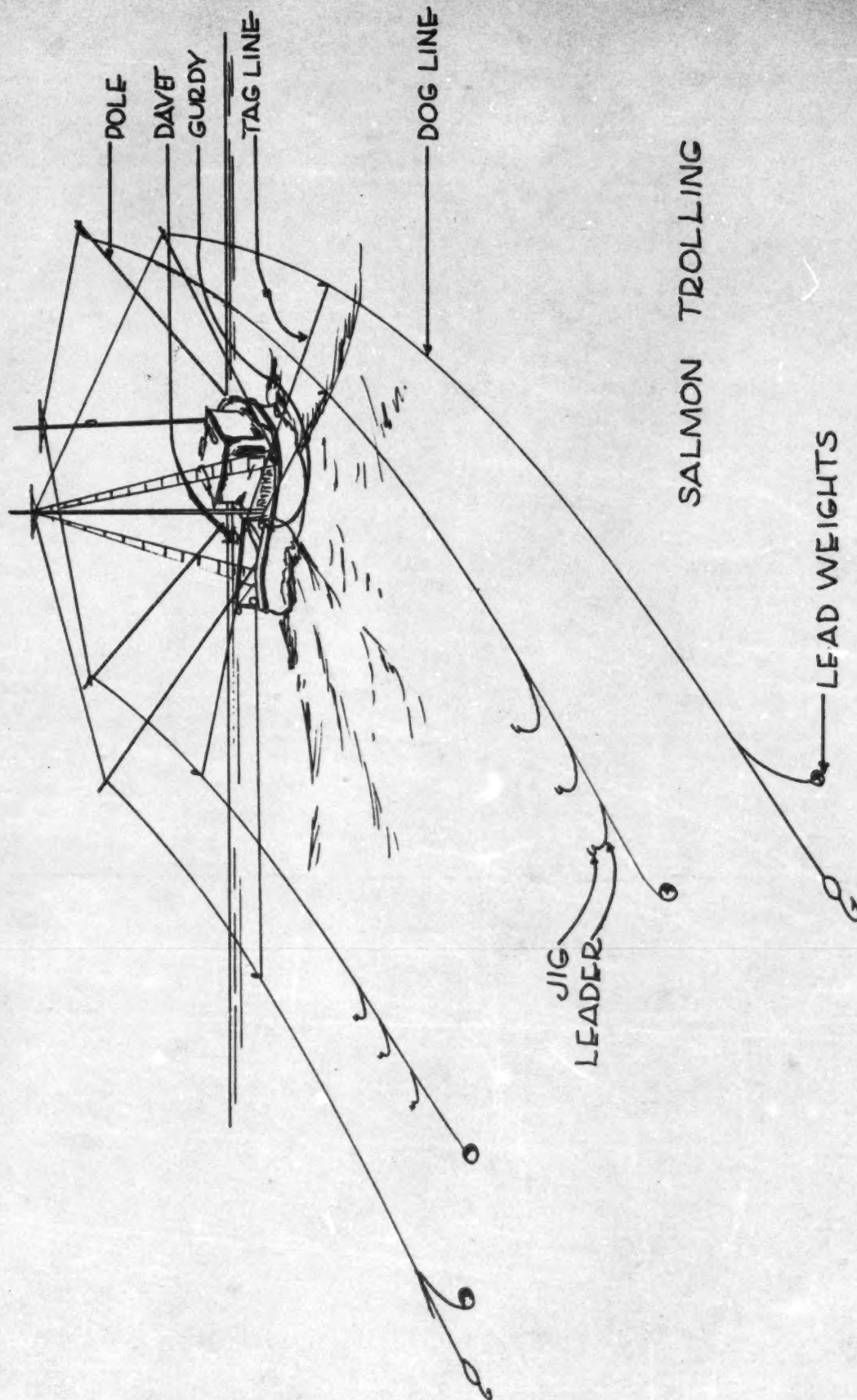
10. The deck hand places the fish in a plastic lined box of water where the motion of the boat will wash the blood out of the fish. It is left in this box for about 15-20 minutes.
11. The deck hand takes the fish from the box and sends it down the chute into the hold.
12. Within 1-1 1/2 hours, the deck hand goes down into the hold and places crushed ice on the bottom fish box. He then places it in the box and covers it with ice. Smaller fish are always placed on the top to prevent crushing of the meat.
13. If the boat has an Iron Mike (automatic pilot), the captain may set course and come back to help the deck hand run the gear.
14. When the boat turns, the deck hand must take in all three lines on the side opposite the direction of the turn to prevent gear on both sides of the boat from fouling.

JOB AND PROCESS FLOW CHART: TROLLING TUNA (ALBACORE) JIG BOAT

1. The deck hand and captain rig the boat for the tuna fishing season:
 - a. Buy food and gear for the trip.
 - b. May purchase ice if the boat has no refrigeration.
 - c. Lower the poles on each side of the boat.
 - d. Hook up the 4-6 lines to each pole.
 - e. Cut the lines to the desired length.
 - f. Attach a one fathom leader to each line.
 - g. Attach a jig to the end of each leader.
 - h. Attach a hook to the end of each leader and slide the jig down to cover the hook.
2. The captain pilots the boat to the area it is going to fish using the electronic navigation aids and a compass. Also uses a special thermometer to tell the temperature of the water. Will use the radio telephone and radio to contact other fishermen when the fish are found.
3. The deck hand uses the albacore gurdies to let out the 12 lines, 6 to a side. As each line is almost out, he attaches the tag line and then continues to let out the line. If method B is used to rig the gear, on the boat, the deck hand will let out the main line with the gurdy.
4. When the albacore tuna strike, the deck hand pulls the tag line in and places it in the albacore gurdy reel which pulls the main line in, hydraulically coiling the line on the floor of the cockpit.
- 4a. If the gear is rigged as in method B, the gurdy is activated by the deck hand and this hydraulically spools the main line pulling the fish to the stern of the boat.
5. The deck hand hauls the tuna on board and removes the hook.
6. The deck hand then uses the gurdy to feed out first the main line, then (in the case of gear rigged by method A) the tag line.
7. When the albacore tuna has remained on the deck long enough to lose all the body temperature it is going to, the deck hand puts the fish in the hold.
- 7a. If the boat uses ice to freeze the fish, the deck hand places the fish on a layer of crushed ice belly down and tail aft in the bin. Every layer or two of tuna, another layer of ice is added.
- 7b. If the boat has a brine spray refrigeration unit, the fish are placed in the holds and a solution of cold brine is sprayed or pumped over them to freeze the fish.
- 7c. If the boat uses forced air refrigeration, the deck hand stacks the fish in wire bins where they are left to freeze in the refrigerated air which is circulated by fans.

JOB AND PROCESS FLOW CHART: TROLLING ALBACORE TUNA BAIT BOAT

1. The deck hands and the captain rig the boat for the tuna fishing season:
 - a. Purchase food and gear for the trip.
 - b. May purchase ice if no refrigeration is on the boat.
 - c. Either purchases live bait or may catch his own at sea and places it in the bait tank filled with sea water.
 - d. Attaches flashers and hooks to one of a two fathom leader, and attaches the other end to a short hand pole.
 - e. Attaches the bait rack to the stern of the boat.
2. Same as the jig boat.
3. When albacore tuna strike on a jig, the captain stops the boat on what is called a bait stop. Bait from the bait tank is thrown overboard to attract the tuna to the boat by the deck hand.
4. Three to five deck hands stand in the bait rack and cast the flashers and hooks into the water with the hand poles.
5. When the fish strike, the deck hand jerks the pole pulling the tuna out of the water and then removes the hook from the fish and casts again.
6. Same as steps 4 to 7c on the jig boat.

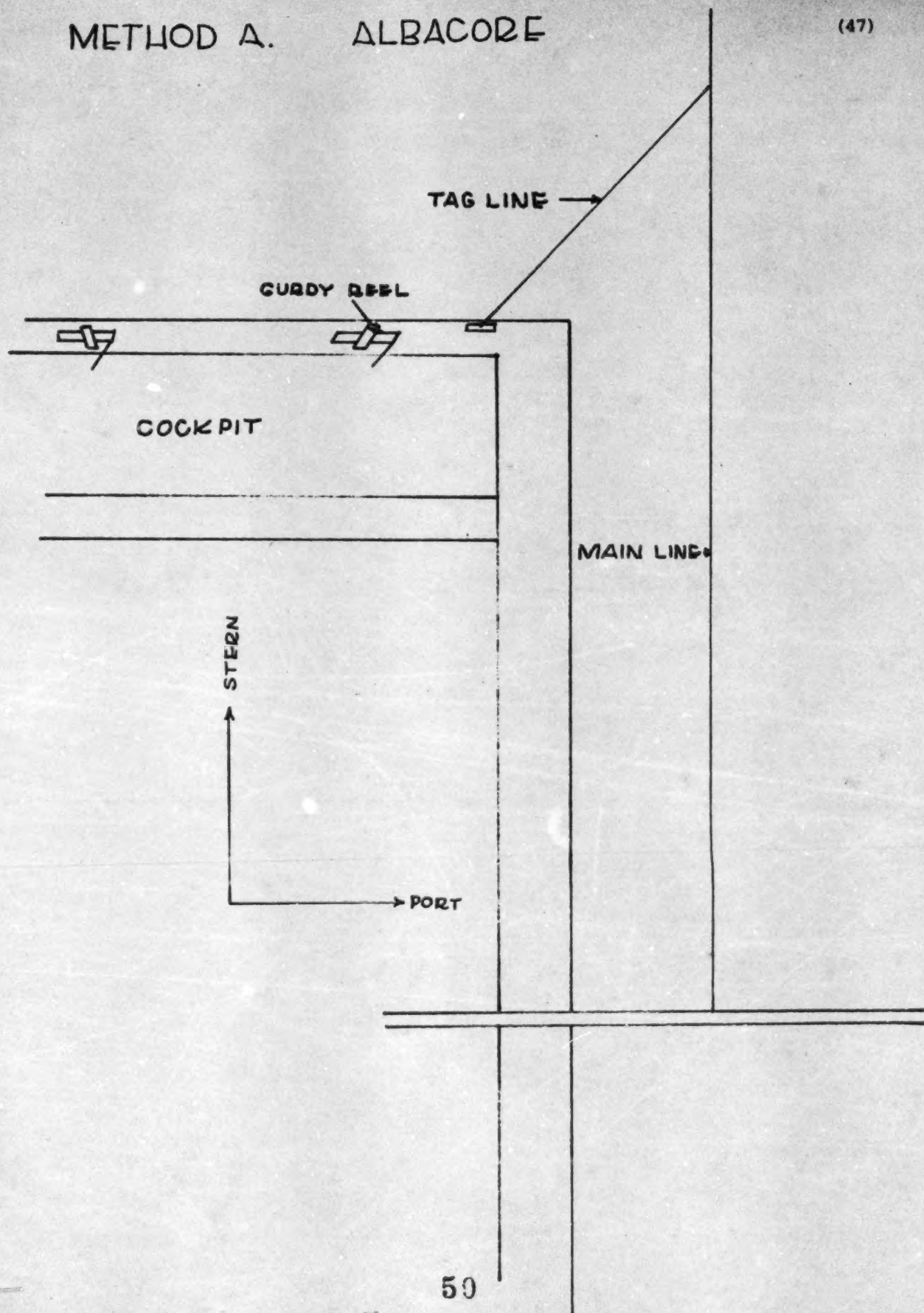


SALMON TROLLING

METHOD A.

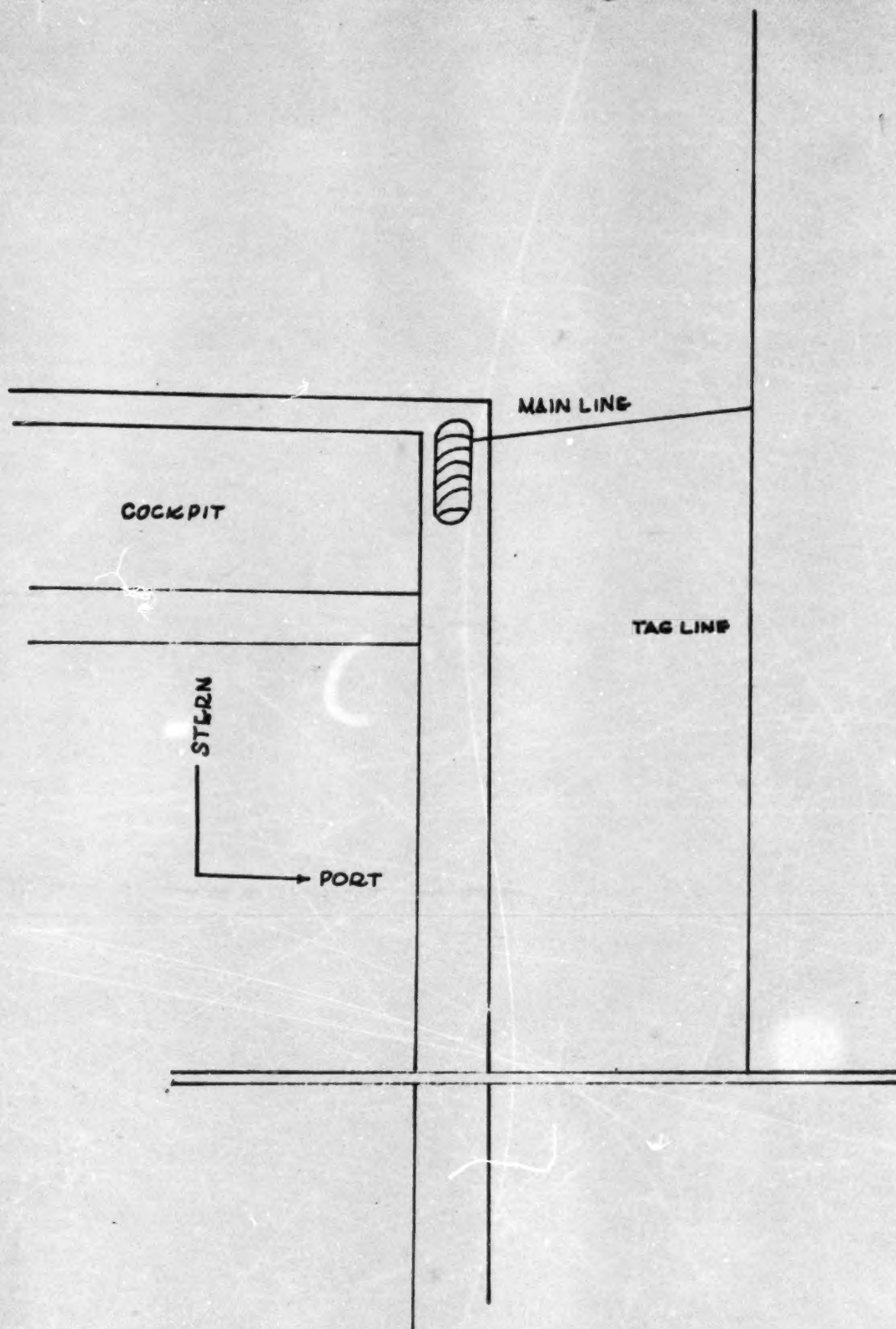
ALBACORE

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METHOD B. ALBACORE

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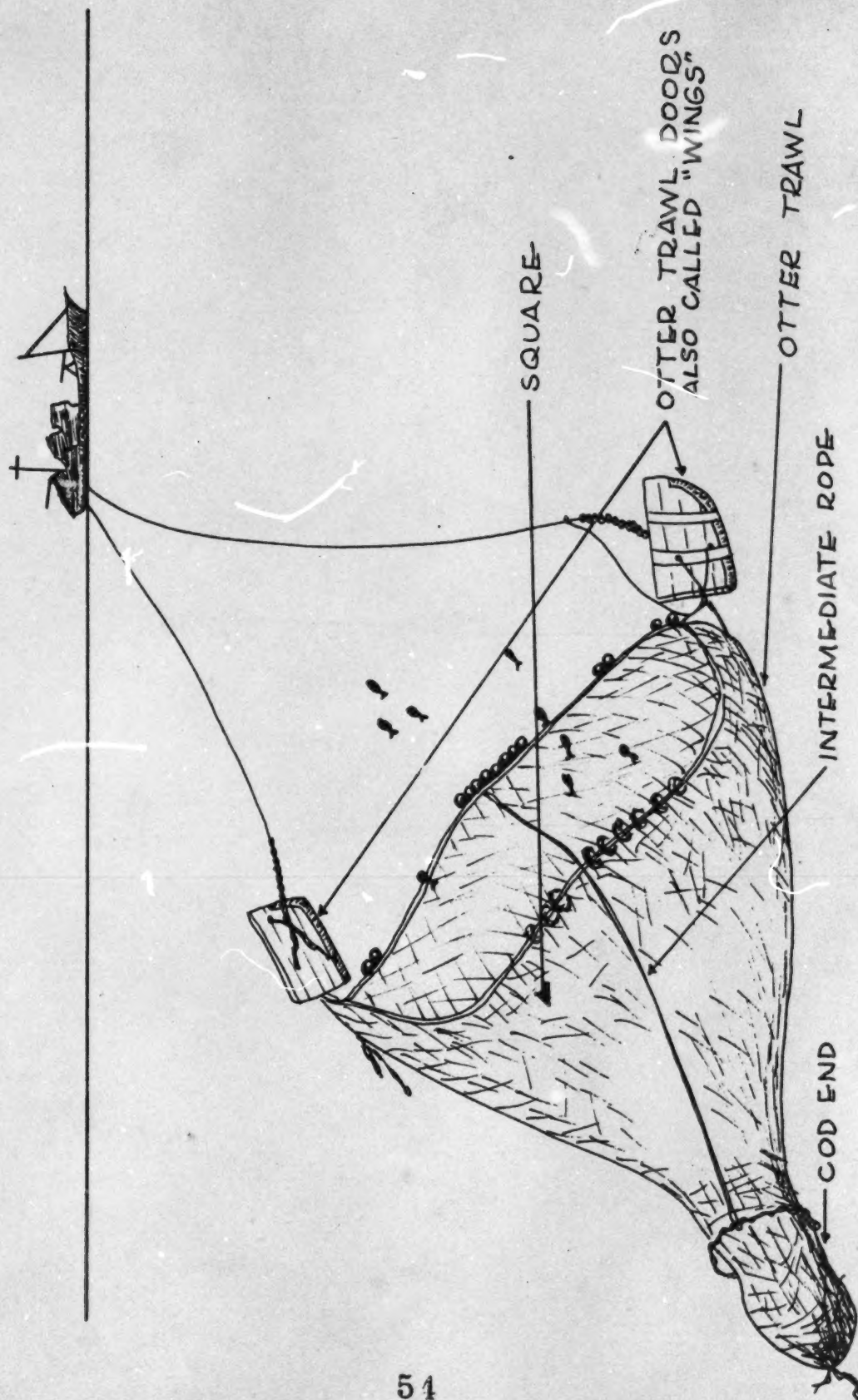


JOB AND PROCESS FLOW CHART: OTTER TRAWLING OR DRAG FISHING.

1. The deck hand and the captain rig the boat for the trawling season:
 - a. If a new net is needed, they may cut, weave and rig this new net.
 - b. Check the drag cables to see if any need repairing or replacing.
 - c. Check the hydraulic winches on the cable spools and net spools (if they are used on the boat).
 - d. If the net has been removed from the reel, the net will be re-wound on the reel starting with the wings.
 - e. Check the cables and winches which operate the boom used to lift the cod end of the net from the water to the deck.
 - f. Check the engines and refrigeration systems to see that they are running properly (if the boat has refrigeration).
 - g. Buys food and other supplies necessary for the trip which can last up to three days in good weather.
 - h. Buys ice if the boat has no refrigeration unit.
2. Captain pilots the boat out to the area to be fished using the electronic navigation aids, compass and charts.
3. Setting the otter trawl net on a boat equipped with net reels:
 - a. On a boat with a net reel around which the net is wound, the deck hands activate the winch to unreel the net off the stern of the boat.
 - b. As the net goes out, he attaches the trawling cables to the chains on the otter doors.
 - c. When the bridle end of the wings starts to come off the reel, the deck hand attaches the bridles to the doors. The doors are pulled overboard into the water by the weight pull of the net.
- 3.1 Setting the otter trawl net on a boat not equipped with net reels:
 - a. The deck hands attach the rope from the boom to the cod end of the net and use the winch to raise the net and swing it out over the water.
 - b. The rope is then unhooked and the boom swung back over the deck where the process is repeated by the deckhand with another section of net.
 - c. The deck hand attaches the bridle to the doors and uses the winch and boom to swing them over the side of the boat after attaching the trawling cables onto the door.
4. The deck hand activates the hydraulic winches which control the spools around which the trawling cables are wound. They unspool enough cable to let the net out the desired distance behind the boat and down to the desired depth.
5. The captain pilots the boat, watching the fathometer which shows the contour of the bottom. When a hill or wreck appears on the floor of the ocean, the captain steers the vessel around it or speeds up the boat to lift the net over the obstruction.
6. Depending upon the type of bottom and the type of fishing being done, the captain will trawl for from 1/2 to over 2 hours before he signals the deck hands to reel in the net.
7. On a boat equipped with net reels: The deck hands will activate the winches which reel in the trawling lines. When the doors come on board, the bridle is disconnected and the wings wound onto the net reel in the stern of the boat.

- 7.1 On a boat not equipped with net reels: the deck hands activate the winches which reel in the two trawling cables. When the doors are along side ~~the~~ boat, the boom rope is sometimes used to haul them aboard.
8. As the belly of the net comes near the stern of the boat or along side and a cable from a boom is attached to the intermediate rope. The captain then turns the boat around so that the net hangs along side of the boat. Then another boom rope is attached to the splitting strap and the net brought on board to a position suspended over the deck.
9. The lace on the cod end of the net is pulled allowing the fish to drop from the net to the deck.
10. On a boat equipped with net reels: the deck hands activate the winches to unspool the net and as the wings come unspooled, they are attached to the bridle.
- 10.1 On a boat not equipped with net reels: Same as the process described in 3.1 a and b.
11. On a boat equipped with net reels: the weight of the net pulls the doors overboard and the deck hands activate the winches which unspool the trawl cables.
- 11.1 On a boat not equipped with net reels: the deck hand attaches the boom cables to the doors and winches them over the side of the boat.
12. The deck hands sort the fish according to species on the deck and throw them into the fish hold where they are placed in bins and iced or if there is refrigeration, they are left to freeze.
13. The deck hands wash down the deck with sea water and a hose.
- 13.1 Weather permitting, this process (numbers 1-15) will go on 24 hours a day at sea.
14. The deck hands scrub the boat down with water and detergent at least once a day while at sea.
15. At the fishery, the deck hands shovel the fish and ice into boxes which are hoisted from the fish hold to the docks.
16. When the boat is empty, the bins and fish hold must be scrubbed down with detergent and water to destroy any bacteria left by the catch.

NOTE: Most drag boats carry a spare net. If the boat has a net reel (many times the boat will have two reels), one is in use and one is a spare. These spare nets are used in case the other net becomes fouled and damaged in fishing. This facilitates continued fishing while the damaged net is being repaired.



CAPTAIN

OCCUPATIONAL DESCRIPTION

Must know all about rigging the equipment of the boat and what equipment is needed. Must know how to navigate the boat in the sea using the electronic navigation aids and charts. Must know all about the running of the boat and be able to do minor repairs at sea including work in electronics, diesel mechanics, hydraulics, welding, and carpentry. Must be able to read charts and maps telling of currents and bottom contours. Must be able to use the electronic equipment on board the vessel to find the depth of the water, the location of fish, the temperature of the water and the engine indicators. Must know about taxes as they relate to the fishermen and his employees and be aware of the laws that regulate the commercial fisherman and his job. He must know about collective bargaining for better fish prices and know at what time of year the price is best on a particular type of fish. In general, the captain of a fishing boat must be a jack of all trades. Must also make up and repair any nets used in fishing.

EQUIPMENT

All the fishing equipment used on the boat: radar, Loran, radio direction finder, fathometer, compass, radio telephone, ship to shore phone, and citizen band radio.

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, though a course in boating and fishing law could help.

Training: Can start as a deck hand and gain experience, then work way up to captain of someone's boat, then buy one.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed inside the pilot house of the boat and outside in the weather. The worker is subject to the hazards of being at sea and at the mercy of the weather, but with good judgment, is in no immediate danger. The work requires above average strength and endurance as the work is not steady, but will come in spurts as the fish bite. The captain may do everything that the deck hand must do if it is a small boat.

WORKER CHARACTERISTICS

Aptitudes: Must be able to pilot a boat at sea and have the necessary knowledge to read and use all of the navigation aids on the boat. Must like to work out in the weather and at least like the sea.

Temperaments: Must be able to recognize the weather and know when it is time to quit fishing and come in or lay over for the night. Must be able to command the respect of his crew as well as their trust. Must be self-reliant.

DECK HAND

OCCUPATIONAL DESCRIPTION

Must know how to rig all of the fishing equipment on the boat and help the captain change the rigging at the beginning of each new fishing season. Must run the hydraulic gurdies and winches to let out the equipment whether it be nets or lines. Must reel in the gear when fish are caught and remove the fish from the nets or lines. Will then sort the fish as to species and stow them in the hold after doing any gutting or other processing that is done for that species of fish in getting it ready to freeze. Will pack the fish in ice, or will place it in the hold so that it can be frozen. May help the captain do any minor repairs to the boat at sea and mend any nets that have been damaged. On a larger boat, he will do most of the actual fishing and freezing of the fish. (See job and process flow chart for each of the different types of fisheries in the BACKGROUND section of this unit.)

EQUIPMENT

Gurdies and winches of various types, nets, lines, jigs, hooks, leaders, lead weights, boots, rain gear, fish knife, refrigeration machines, blocks, and gloves.

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, though the employer prefers at least grammar school education.

Training: The worker will receive on the job training from the captain in the technique used aboard that boat during a particular fishing season.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is done mostly outside in the weather. It is fairly quiet and the worker is subject to hazards of working on a boat at sea. The worker needs above average physical strength and endurance because the work is not steady, but comes when the fish are biting. Must be able to handle the heavy equipment aboard the boat and the fish that are caught.

WORKER CHARACTERISTICS

Aptitudes: Must possess average aptitudes in motor coordination, eye-hand-foot coordination and manual dexterity. Must enjoy working at sea and on the water.

Temperaments: Must be able to work quickly and efficiently under conditions of stress due to the fish biting at a certain time and the amount of work that has to be done quickly at that time. Must be able to do work without direct supervision at times.

CHANCES FOR PROMOTION

May be promoted to captain as he gains experience.

SALES CLERK: FISHING SUPPLY STORE

OCCUPATIONAL DESCRIPTION

Orders all stock for the store, prices it when it arrives, and helps sell it to the customers. Must know about the fishing industry and all of the equipment used in the boats. Helps make out fishing licenses for people going out on the charter fishing boats. In a small business this person may be the manager and/or owner. May take the inventory of goods on the shelves before ordering new supplies and make up crab pots and rings out of net, iron rings, wire and rubber wrapping.

EQUIPMENT

Cash register, invoices, adding machine, crab pot and ring, making equipment and fishing licenses.

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although a high school education is preferred.

Training: Will get on the job training, but should be familiar with the fishing industry and the equipment used.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is performed indoors and under quiet conditions. The worker is subject to no immediate hazards and the work only requires average physical strength and endurance.

WORKER CHARACTERISTICS

Aptitudes: Must possess average aptitudes in motor coordination and manual dexterity. Must be able to operate a cash register and adding machine. Must be able to read and interpret price books.

Temperaments: Must be able to work well with the public and work well without direct supervision.

CHANCES FOR PROMOTION

If this person is the owner of the store, then he has about reached the top of the ladder. If he is working for someone, he might be promoted to manager.

STOCK BOY-FISHING SUPPLY STORE

OCCUPATIONAL DESCRIPTION

Puts new stock on the shelves in the store or in the storeroom. Makes out fishing licenses for the sport fishermen going out on the charter boats. He answers the phone when the others are busy and may wait on customers though this is not his job. Must be aware of where all goods are in the store and know what equipment is used for different purposes. Unloads the bait that has been purchased and wraps it in cellophane, stacking it in the freezer to be sold later to the fishermen.

EQUIPMENT

No special equipment necessary.

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although employers prefer at least grammar school education.

Training: Will get on the job training.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed inside under quiet conditions. Worker is subject to no immediate hazards and requires only average physical strength and endurance.

WORKER CHARACTERISTICS

Aptitudes: Must possess average aptitudes in motor coordination and manual dexterity.

Temperaments: Must be able to work at tasks without direct supervision. Must be able to meet the public and be pleasing and helpful.

CHANCES FOR PROMOTION

If the worker shows a willingness to learn the business and do as good a job as possible, the worker may be hired for the coming summer. Only part-time work.